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PYELITIS: EARLY SYMPTOMS, DIAGNOSIS and TREATMENT*

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The majority of renal infections in children, and many in adults, particularly in association with pregnancy, are commonly designated by the term pyelitis, which the famous French physician, Rayer, originated in 1837 to specify infection of the kidney pelvis in contradistinction to infection solely of the parenchyma, or a combination of infection of the pelvis and parenchyma. In his excellent monograph at that early period Rayer observed and emphasized that infection of the renal pelvis rapidly involved the renal parenchyma and conversely infection quickly involved the pelvis from the renal parenchyma. Since this early description there has been voluminous literature and much controversy as to the actual clinico pathological picture of renal infections in children, and only in the past decade has Helmholtz and others shown that in the so-called pyelitis of children, the infection is usually more extensive with parenchymal involvement and the true picture is that of a diffuse interstitial suppurative nephritis.

The etiological factors and *modus operandi* concerned in renal bacterial invasion must take into consideration the various accessible pathways or routes available to the attacking pathogenic organisms, but of far greater importance for successful invasion are the accessory factors which increase the vulnerability of the kidney, lessen its resistance to repeated attacks, and if obstructive in character, the gradual production of hydronephrotic and pyelonephritic atrophy.

Pathogenic organisms may in rare instances reach the kidneys by continuity as in the extension of an empyemic process beneath the

crus of the diaphragm and invade the perinephric space. The hematogenous, lymphogenous, lymphohematogenous and urogenous or urogenitogenous routes are the more usual pathways involved and clinically indicated as the invading channels traveled by the specific organism.

Ascending invasion of the kidneys may be vesico-ureteral, pyelo-ureteral, or pyelo-parenchymal, and is usually closely associated with one of the many types of urinary tract obstruction or neuro-muscular dysfunction. In vesico-ureteral ascension it has been definitely established, clinically and experimentally, that the invading organisms gain the renal pelvis by a reflux, with or without disease of the uretero-vesical orifice. It is, however, more frequently found in long standing cases of vesical neck or urethral obstruction and when the uretero-vesical orifice has lost its tone. Lymphogenous, coecal or bacillary renal invasion has been experimentally shown to have taken place, but clinically it is somewhat difficult to establish a direct pathway and a characteristic renal type of lesion. The lymphatic ducts convey organisms from various infected lymphatic nodes to the hematogenous route.

The ascent of bacteria from the renal pelvis to the renal tubules and parenchyma producing ascending pyelonephritis is possible by means of a pyelovenous or pyelotubular, pyelotubulo-venous or pyelo-tubulo-lymphatic backflow and by extension from any one of these channels to the interstitial or parenchymal substance.

Bacteremia takes place through the mechanism of pyelovenous backflow.

In hematogenous invasion of the kidneys the origin of the bacteremia may be from a general source as infectious fevers, or from a focal or common localized source as furuncles, carbuncles, infected teeth, tonsils, sinuses, gall bladder, prostate gland or miscellaneous infection anywhere in the intestinal tract or in

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the male or female genital organs. The three most frequent sources of bacteremias of renal significance arise from (a) coccal skin infections with the formation of the renal cortical abscess and the renal carbuncle with subsequent perinephritic abscess development, or if there is a massive bacterial attack the whole organ becomes studded with small abscesses producing the clinical picture of acute hematogenous suppurative nephritis, (b) intestinal tract lesions in which case the bacteremia is of the colon bacillus family or (c) the male urethra and prostate gland as the source of coccal or bacillus coli bacteremias.

Although renal infections are definitely produced by invasion of pathogenic organisms there are several predisposing and accessory factors which are directly responsible for bacteria overcoming the last barrier and actually becoming entrenched in the kidney itself. Sex, age, trauma, toxemia, renal mobility, neuro-muscular disease and congenital malformations are all important causative factors in the production of renal vulnerability but mechanical lesions, both congenital and acquired with its concomitant urinary stasis, are the most important and responsible factors concerned in renal infections.

A classification of congenital and acquired mechanical obstructive lesions of the urinary tract presents not only a varied, interesting and most comprehensive tabulation, but from a clinical and etiologic standpoint, the basis of a host of uropathic conditions incident to the development of urinary stasis, hydronephrosis and secondarily renal infections and calculus formations.

In the advent of ascending infection whether the underlying obstructive factor is mechanical or neurogenic in origin, there develops certain overlapping steps of advancement in renal involvement, and these stages are designated by the terms pyelitis, pyelonephritis, infected hydronephrosis, and pyonephrosis and their common denominator is pyuria while in cortical abscess, renal carbuncles, and perinephritic abscess, the presence of pyuria depends upon whether extension has progressed and involved a minor calyx and the renal pelvis. In pyelitis the infection has either come from above, in which

case the renal parenchyma is first involved or if from below it involves the renal pelvis first and secondarily the parenchyma, and the end result is pyelonephritis. Uncomplicated pyelitis is infrequently found as visualization of the renal pelvis shows in most cases that there is dilatation of the renal pelvis incident to an obstructive process and that the condition is actually an infected hydronephrosis.

A pertinent question now arises as to what constitutes pyuria and the urologist on a Hospital Staff is constantly requested by the medical, surgical, and pediatric services to determine the source and cause. In the immediately voided and uncentrifuged specimen of urine from the male or catheterized specimen from the female the presence of five or more leucocytes per low power microscopic field is considered pathologic and its origin should be investigated.

In a diagnostic urologic investigation for the determination of the source of pyuria and at the same time attempt to visualize the cause of its presence, the procedure is promptly executed on the modern cystoscopic and pyelographic table. A table of this type with its flexibility and mechanism for raising the patient from the horizontal to the upright position is most convenient as the whole study is quickly performed under local anesthesia with little discomfort for the adult patient. The child will need an anesthetic. Cystoscopic inspection is made of the urethra, vesical neck, bladder, and renal function is determined. Ureteral catheterization procures a specimen of urine from each kidney for microscopic examination and culture. A scout x-ray picture is then taken and pyelograms in the recumbent and erect positions rapidly made. The source of the pyuria is determined and culture shows the type of organism. The scout film will show a calculus, if present, and the pyelographic study localize it in the renal pelvis or calices, the presence and extent of hydronephrosis, caliectasis and any excessive renal movability, rotation or congenital malformation. The following chart illustrates the clinical laboratory, cystoscopic and pyelographic differential diagnostic findings in the four chief types of renal infection:

Differential Diagnosis

	Pyelitis	Hydronephrosis Infected	Pyelonephritis	Pyonephrosis
Urine	Pus cells Bacteria	Pus cells Bacteria	Pus cells Bacteria	Pus cells Bacteria
Renal function as determined by intravenous indigo carmin	Normal	Normal or slight delay	None	None
Roentgeno- grams	Calculus + or —	Calculus + or —	Calculus + or —	Calculus + or —
Pyelography	Ptosis + or — Slight Dilatation of renal pelvis or caliectasis	Ptosis + or — Enlarged Renal pelvis and calices	Ptosis + or — Clubbing and feathery appear- ance of minor calices	Ptosis + or — Large pelvis with efface- ment of calices

The determination of renal function by either intravenous indigocarmin or phenolsulfonephthalein at the time of the cystoscopic examination enables a prognosis to be immediately estimated of the involved kidney's functional capacity and its potential usefulness, providing its integrity be established.

A comparative study of Tables I and II, particularly in regard to renal function as determined by intravenous indigocarmin and observing its appearance cystoscopically, shows in the cases of pyelitis in Table I that the involved kidney has good function and the infection promptly improved or disappeared

TABLE I
Chart of Ten Cases of Pyelitis

Case	Age	Sex	Duration of Symptoms	Kidney Involved R L	Predisposing Condition	White Blood Count	Indigo Carmin R L	Urine	Bacteria	Treatment	Result
C. C.	20	F	1 month	R	Ptosis	11,600	10 10	30-35	B. coli	Renal lavage Support	Improved
M. B.	40	F	4 days	L	Tonsillitis Ptosis	12,500	5 5½	Loaded	B. coli	Renal lavage Support	Improved
E. D.	30	F	1 week	L	Ptosis	6,200	6 6	Loaded	No growth	Renal lavage Support	Improved
A. C.	27	F	1 week	L	Ptosis	16,500	6½ 10½	12-15	B. coli	Renal lavage Support	Improved
N. P.	24	F	5 weeks	R	Ptosis	11,500	8 4	Loaded	No growth	Renal lavage Support	Recovered
D. M.	27	M	10 days	R L	Acute Tonsillitis	18,500	8 6	Loaded	B. coli	T & A	Improved
W. E.	40	M	4 months	L	Respiratory Infection	12,000	3½ 5	15-20	Strep	Renal lavage Sulfa drugs	Recovered
M. L.	32	F	2 weeks	R	Pregnancy	10,000	9½ 4	Loaded	No growth	Renal lavage	Recovered
S. E.	34	F	1 month	R	Ptosis	16,000	11 5	Loaded	B. coli	Renal lavage	Recovered
A. B.	36	F	2 years	R	Ptosis	17,000	10 5	Loaded	B. coli Staph alb	Nephropexy	Recovered

TABLE II
Chart of Ten Cases of Pyelonephritis

Case	Age	Sex	Duration of Symptoms	Kidney Involved R L	Predisposing Disease	White Blood Count	Indigo Carmin R L	Urine	Bacteria	Operation	Result
S. G.	60	M	5 days	R	Prostatic Hypertrophy	20,000	0 5	Loaded	Strep	Bacteremia Nephrotomy	Recovered
F. S.	65	M	3 weeks	R	Median Bar Chr. prostatitis	15,500	0 5½	Loaded	No growth	Nephrectomy	Recovered
F. B.	68	M	4 weeks	R	Median Bar Chr. prostatitis Diabetes	15,400	0 6	Loaded	B. coli	Nephrectomy	Recovered
E. B.	38	F	5 weeks	R	Papillary carcinoma of bladder	12,500	0 7	Loaded	No growth	Nephrectomy	Recovered
E. R.	18	F	8 months	R	Uretero- pelvic bands	8,800	0 4	Loaded	No growth	Nephrectomy	Recovered
C. H.	66	M	2 weeks	L	Anomalous vessel	10,000	6 0	Loaded	B. coli	Nephrolithot- omy, severed vessel	Septicemia Death
H. K.	55	M	2 months	R	Renal calculus Papilloma of Bladder Diabetes	10,000	0 5½	Loaded	Staph aureus	Nephrectomy	Septicemia Death
M. H.	57	F	4 months	R	Cystitis	7,000	0 6	Loaded	Staph Albus	Nephrectomy	Death Cardiac
E. C.	19	M	10 days	L	Diverticulum of bladder	18,000	5 0	Loaded	B. coli St. albus	Nephrectomy	Recovered
A. S.	70	M	2 weeks	R	Carcinoma of bladder	20,000	0 8	Loaded	B. coli	Nephrectomy	Recovered

with appropriate treatment. In striking contrast the involved kidneys in Table II failed to show any appearance of indigo carmin in 20 minutes of observation and upon nephrectomy each kidney showed marked pyelonephritis. Upon examination and section of a kidney of the acute and diffuse interstitial suppurative type, the surface may show many superficial cortical abscesses of various sizes and the cut surface areas of suppuration, some small and others larger due to a coalescence of several small bacterial localizations. In many instances the kidney is greatly congested and swollen and not unlike that of the large white kidney of acute nephritis. The mucosa of the pelvis is reddened, and may show punctuate or diffuse submucous hemorrhagic areas and superficial ulceration. When the renal parenchyma has become involved the histo-pathologic picture is nearly the same in early coccic hematogenous and in early bacillary ascending renal infection.

If the patient survives the acute attack and there is no complicating congenital or acquired obstructive lesion, the infection usually is self-limited and in a few weeks in favorable cases the kidney may become quite normal. In some instances the cortical abscess ruptures with the formation of a perinephritic abscess, which demands incision and drainage, leaving an excellently functioning kidney. However, in the severely infected kidney sclerotic contractions may cause compression and contraction and the result is pyelonephritic atrophy—and in the presence of an obstructive process the condition progresses to an infected hydronephrosis, calculous pyelonephritis, and finally pyonephrosis.

Early Symptomatology. In pyelitis neonatorum or urinary infection in the newborn the condition, although not uncommon, is seldom recognized and properly diagnosed. The majority of cases reported have been in boys. Pyuria and positive cultures obtained from the urine indicate the presence of infection. The original site or focus of infection is not readily determined. Campbell reports a boy who clinically manifested acute pyelonephritis and at autopsy showed bilateral diffuse suppurative nephritis secondary to an umbilical stump infection. The temperature chart may

show a continuous or intermittent course—acute gastro-intestinal disturbances, vomiting, distention and diarrhea may predominate. The diagnosis is made chiefly by the urinary findings.

Pyelitis of Diaper Age. This period extends up to the third year and the symptoms are rarely indications of urinary tract infection. In a typical case the condition is ushered in with chills, fever, restlessness, general apathy and prostration. The temperature range may vary from 102 to 106 degrees. Repeated chills, high fever, profuse perspiration, nausea and vomiting are symptoms indicative of persistent obstruction and are objective directives for prompt urologic investigation. Bacteremia is a common occurrence.

Pyelitis in children of three years of age and over does not present as difficult a diagnostic problem as the child is usually able to call attention to the symptoms of frequency and dysuria, particularly when vesical symptoms present themselves. However fever and gastro-intestinal episodes in the absence of urinary tract symptoms may cause diagnostic errors. The urinalysis should make the diagnosis conclusive.

In the majority of cases the onset is sudden and the chills and fever often suggest pneumonia. The accompanying gastro-intestinal symptoms include nausea, vomiting, abdominal distention, rigidity, constipation or diarrhea. Cerebral symptoms may include intense headaches. The child may become delirious, develop convulsions and the neurologic manifestations of meningitis and finally coma.

An interesting study of the late effects of acute pyelitis in girls was made by Wharton, Gray and Guild from the Harriet Lane Home for Invalid Children in Baltimore. Thirty patients returned for follow-up study and these were divided into two groups (a) Those who had only one attack of pyelitis in childhood, 9 cases and (b) those who had more than one attack, 21 cases.

Group a. In the 9 cases, in which there was an average of 13 years, after an attack of pyelitis, urologic examination showed only 3 cases to have normal urinary tracts. Six showed definite abnormalities, 5 gave positive cultures, and one girl who had streptococci in urine 8

years ago has the same organism at the time of the study.

Group b. In those having had more than one attack, 21 cases were studied on an average of 10 years after the last flare up. 9 cases showed normal urinary tracts, while 11 cases showed abnormal findings. 10 gave positive cultures.

A summary of these 30 patients showed that 17 or 57% have definite abnormalities of the urinary tract, 15 or 50% have positive urinary cultures, 2 have renal calculi, and one has had a nephrectomy. The study forcibly shows that pyelitis in young girls cannot be regarded lightly and that urinary tract obstructions and abnormalities should be adequately corrected.

Pyelitis of adults is seldom found as an isolated infection confined to the pelvis of the kidney in the absence of an obstructive urinary tract lesion. It is, however, frequently encountered in patients with congenital and acquired types of urinary tract obstructions and as a complication of pregnancy. The obstructive process causes renal pelvic distention, and urinary stasis. Bacteria readily gains entrance by the hematogenous or lymphogenous routes and the pathologic process is now properly called an infected hydronephrosis.

The term pyelitis of pregnancy is used broadly to include practically all infections of the ureters and kidneys occurring during the period of pregnancy. Ureteral dilatation develops in practically all pregnant women and in the resulting urinary stasis bacteria readily gain entrance, find fertile soil, little resistance and unless properly managed, ureteritis, pyelitis, infected hydronephrosis, pyelonephritis, and pyonephrosis may follow in sequence. In some well known maternity clinics the incidence of infection runs as high as 14%, infant mortality 10-12% and maternal mortality approximately 3%. The colon bacillus is more commonly found as the invading organism. Staphylococci and streptococci rank next in frequency of occurrence.

The most common symptoms in the average case are chills, fever, nausea, vomiting, malaise, and in severe cases prostration. Locally there may be pain and discomfort in the kidney areas. If cystitis develops, burning frequency, and urgency are additional distressing discomforts.

Prognosis—Acute Pyelitis—Pyelonephritis

- I. The mortality in infants—"pyelitis of the newborn" 10-30%
Incidence increased by complications and congenital anomalies
- II. Mortality of pyelitis in "diaper age"—children 2 years of age
Coppert—84 cases—12%
Thayson—71 cases—14.6%
Rodkin and Kagnox—72 cases—22%
Babies Hospital, N. Y.—140 cases—22.8%
Caulk—172 cases—High incidence of complications—40%
- III. Mortality in children over 2 years of age
Thayson—71 cases—over age of two—0%
Wilkinson—British Medical Journal—3%

Chronic Interstitial Suppurative Pyelonephritis

	Children	Cured	Improved	Died
Campbell ..	580	152-26.2%	246-42.4%	58-10%
Braasch & Cathcart	2,040 adults	33%	33%	Unimproved 33%
Pyelitis of Pregnancy				
Traut	136 cases	4 deaths	3%	

Treatment. Thorough investigation and diagnostic procedures which should include an exhaustive search of the entire body for possible foci of infection and visualization of the entire urinary tract, preferably by retrograde pyelographic studies and determination of type of infecting organism are imperatives before an intelligent outline or plan of treatment be constructively formulated.

Good judgment must be exercised as regards cystoscopic and pyelographic procedures, particularly when the patient is acutely ill. However, the patient acutely ill with chills, fever, and gastro-intestinal symptoms secondarily to an obstructive urinary tract lesion and associated infection has an infinitely better recovery outlook if an early diagnosis is made and the obstructive process immediately eliminated.

Many patients ill from acute hematogenous infections of the kidney and who have no urinary tract obstruction, congenital or acquired, recover practically simultaneously with the disappearance of their acute respiratory or other type of focal infection. The possible presence of a urinary tract obstructive process should be investigated in every instance.

General measures of treatment in acute renal infections:

1. Culture of urine
2. Complete rest in bed and bland diet
3. Adequate fluid intake and supplemented when necessary with additional amounts by bowel, subcutaneously or intravenously, unless specifically contraindicated, 5% glucose solution in water or salt solution is most excellent for intravenous use.
4. Correction of constipation and changing of intestinal flora. Castor oil is preferable when colon bacilli bacteriuria is present.
5. Promotion of diuresis and perspiration. Hot wet packs and acetylsalicylic acid are excellent for promoting skin elimination.
6. Estimation of hydrogen ion concentration of the urine and the blood. This procedure is particularly stressed as some urinary antiseptic preparations are more potent in acid urine and others in alkaline urine.
7. Administration of urinary antiseptic preparations
8. Removal of all foci of infection
9. Correction of stasis of urine in ureter and renal pelvis by catheter drainage or surgical procedures.

Medication:

A. Oral

Pyridium—inhibits hemolytic streptococci in urine

Methanamine—effective in acid urine

Mandelic acid—effective for streptococcus faecalis

Sulfa drugs—sulfadiazine—effective for streptococci and staphylococci

Penicillin—effective for streptococci and staphylococci

B. Intravenous:

Neo arsphenamine and mapharsen are bacteriostatic and bactericidal for gram positive cocci and streptococcus faecalis

Mercurochrome:

5 to 10% of a 1% aqueous solution in 500 cc. of normal salt solution stimulates the reticulo-endothelial system. Follow up with sulfadiazine orally $\frac{1}{2}$ to 1 gram q.i.d. or Sodium sulfadiazine—10 cc. of 25%

solution diluted with 40 cc. sterile water intravenously.

Blood transfusions—multiple

C. Intramuscular:

Penicillin—100,000 to 1,000,000 Oxford units, effective for staphylococci and streptococci infections

The treatment of pyelitis of pregnancy should be practically the same as pyelonephritis. The incidence of acute pyelitis during pregnancy is greater if she commences the pregnancy with a chronic urinary infection. Baird found in his study of 87 women who had pyelitis during a former pregnancy, 46 had pyelitis during subsequent pregnancies. Obstructive urinary tract lesions must be differentiated from interference with drainage caused by the pregnant uterus and corrected.

A true uretero-pyelitis may exist in cases in which the gravid uterus produces stasis of urine but unless relieved or in severe infections pyelonephritis develops which is manifested clinically by chills, higher fever and greater toxicity.

Should rest in bed with the foot of bed elevated, supportive measures, and adequate chemotherapy prove ineffective, ureteral dilatation and catheterization is indicated. The ureteral catheter may be allowed to remain in situ for 7-10 days, if properly supervised and its patency maintained.

Progressive renal damage as evidenced by increased nitrogen retention in the blood, persistent high fever and toxemia, uncontrolled or influenced by therapeutic measures are factors to be considered in the interruption of pregnancy.

CONCLUSIONS

1. The clinical finding of pus in the urine is a directive of prime importance for diagnostic investigation.
2. Urinalysis, including culture, should be a routine, in babies and children with obscure causes for chills, fever and gastro-intestinal episodes.
3. Visualization of the urinary tract for congenital malformation and obstructive lesions, preferably by retrograde pyelography is most essential.

4. The obstructive lesion in the interrupted pregnancy case should be adequately corrected.
5. The establishment of free urinary tract drainage prevents advancement of renal destruction and eliminates infection.

1900 Spruce Street.

DISCUSSION

DR. L. W. ANDERSON (Wilmington): I want to compliment Dr. Birdsall on his excellent presentation. There is little that I can add to what has already been said for he has covered the subject most thoroughly. However, I may mention—I don't recall his having mentioned it—that these cases, after they have become subacute or chronic, will frequently present themselves with symptoms of cystitis, or frequency of urination. In other words they may go to their family doctor complaining of bladder trouble and the mistake may be made of irrigating these patients for weeks and even months with the hope of helping them. This does not work.

DR. BIRDSALL: The point Dr. Anderson made I think was a very important point, because a great many of these patients come to you complaining particularly of urinating frequently, and the bladder is the mouthpiece for the whole urinary tract. I remember a case of a patient that had gone from Norfolk to Richmond and to Roanoke and was treated for her cystitis. The doctor asked us to make an investigation of the tract and we found nephritis, yet all of her trouble, from her standpoint, was bladder, but the site of her trouble was up in her kidneys.

EARLY MALIGNANCY OF THE LARYNX: ITS DETECTION AND TREATMENT*

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To understand the implications of malignant disease of the larynx we must first recognize two main classifications of this condition. These terms, based on the region in which the growth is found, are (1) intrinsic and (2) extrinsic lesions.

The intrinsic lesion is found on the vocal cord, subglottic region or laryngeal ventricle,

while the extrinsic variety arises from an area without the laryngeal interior such as the epiglottis, the arytenoids, the ventricular bands, the pyriform sinus or posterior surface of the cricoid cartilage. This distinction in malignant laryngeal lesions is of great importance for the prognosis and treatment is entirely different in these two categories. In the intrinsic group cure can be obtained in about 80% of the cases, whereas in the extrinsic variety about the best one can do is to make the patient more comfortable while awaiting the inevitable. The mixed type is merely a combination of these lesions in an advanced state.

Practically all malignant laryngeal lesions are the squamous cell carcinoma variety, slow growing and radio resistant. A few are basal cell, papillary or adenocarcinomas. These growths are most common in males between the ages of forty and sixty years, but may occur in either sex and at any age. Sarcoma of the larynx is quite rare.

Metastasis from intrinsic cancer occurs late due to the rather sparse lymphatic drainage from the vocal cords and subglottic region. Extrinsic forms, however, spread quickly to the cervical lymph nodes, hence the marked difference in prognosis.

Unfortunately carcinoma of the larynx may exist for weeks or even months before symptoms become pronounced. In the intrinsic type, vocal changes are almost always the first symptom. This may amount to nothing more than occasional huskiness with some tendency to clear the throat. Fatigue and smoking intensify these symptoms, and as a result the patient often explains the condition on these grounds. As the process advances the symptoms are exaggerated until hoarseness is constant and marked. Pain is a late symptom and occurs only when considerable infiltration has occurred. Very late symptoms are cough, dyspnea, stridor, hemorrhage, anemia, loss of weight, dysphagia and internal metastasis.

In extrinsic lesions the initial symptoms are usually a sense of throat irritation, the sensation of fullness or a foreign body, soreness and a tendency to aspirate food particles. Marked dysphagia occurs with infiltration. These lesions tend to ulcerate early and cause pain

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on swallowing, so that the taking of food becomes extremely difficult. Sometimes pain in the ear is a prominent symptom. Aphonia or less marked vocal symptoms occur late in the development of the lesion. Dyspnea is present only after the lesion is large enough to partially obstruct the air way.

The diagnosis of this condition is, of course, of great importance. Intrinsic carcinoma may attack any part of the cord, but is most often found in the middle or anterior third. At first unilateral it appears as a small area of the cord abnormal in appearance. It may be nodular, papillomatous or simply a thickening infiltration. Fixation of the cord does not take place until the growth is well advanced. Inspection of the subglottic region and the laryngeal ventricles must be carefully carried out in all cases.

The extrinsic lesion begins as a hard nodular mass which soon distorts and destroys the normal landmarks of the hypopharynx. Early ulceration takes place, rapid spread to the cervical glands is noticed and in general the course of the disease is much more dramatic, rapid and lethal.

The diagnosis in all forms is made by history, examination and biopsy. The examination may be made indirectly with the laryngeal mirror, and often biopsy material can be secured in this manner by the use of the basket-punch forceps. As a rule, however, if a suspicious lesion is found on examination with the laryngeal mirror, it is more exact to subject the larynx to direct laryngeal examination and secure biopsy material during this examination.

Syphilis and tuberculosis of the larynx must always be considered as possibilities in cases of chronic hoarseness. Serological tests should always be made, if possible, antiluetic treatment instigated. The lesions of tuberculosis objectively are usually fairly easy to differentiate from the neoplastic variety. Be suspicious of neoplasm in all cases when vocal rest and other forms of treatment, such as antiluetic treatment in lues do not cause objective and symptomatic improvement in several weeks.

Untreated laryngeal carcinoma always ends fatally, the life expectancy being approximately two years. On the other hand, the

statistics of Jackson, Sir St. Clair Thomson, MacKenty, Lewis, Tucker, Clerf and C. L. Jackson show a remarkable increase in cures obtained by laryngo-fissure and total laryngectomy.

In intrinsic cases diagnosed early and subjected to early operation about 80% go through life without recurrence.

For intrinsic carcinoma of the larynx, surgery offers the only hope. Laryngo-fissure if the lesion is confined to one cord and has not invaded the arytenoid or crossed the anterior commissure. Total laryngectomy if the lesion is advanced. The former operation removes only a part of the voice box and is desirable, if practical, as the patient retains a functioning voice. Total laryngectomy, of course, removes the entire laryngeal apparatus and renders the patient voiceless. Some patients learn to communicate fairly well by the development of a pseudo voice or the use of an artificial larynx.

All authorities today condemn the use of x-ray and radium therapy in the attempt to control, arrest or cure intrinsic laryngeal cancer. Surgery gives much more hope, as most of the squamous cell lesions of the laryngeal interior are radio-resistant. This type of treatment is used extensively in attempts to make more comfortable the individual suffering from the non-operative extrinsic type of laryngeal lesion.

In conclusion, suspect all cases of hoarseness and subject them to careful study to rule out intrinsic laryngeal neoplasm. If such lesion is found in an early state, the chances of cure by appropriate surgical measures are as good if not better than the same lesion found in any other locality.

2010 Spruce Street.

DISCUSSION

DR. EMIL R. MAAYERBERG (Wilmington): I have thoroughly enjoyed Dr. Houser's talk. It brought out some very important things for us all to remember. The first is early diagnosis in these cases of laryngeal malignancy. I am afraid that most of us are apt to forget the possibility of malignancy at any age. Unfortunately the carcinoma does not wait; it keeps on growing, and when the patient gets around to seeing the laryngologist it is frequently too late to do anything for him, even

surgery of the larynx. I think a safe rule to follow is that when we have a case of changing voice, even though not marked, and a cough, and expectoration, that does not respond quickly to ordinary treatment the patient should be shifted to a physician knowing a great deal about the larynx—somebody who is able to recognize malignancy in its early stages.

The extrinsic-type cancers of the larynx are more apt to develop more definite symptoms, because the patient complains of difficulty in swallowing and painful swallowing, and if treatment does not relieve him quickly enough, it usually shifts off somewhere else. The same with the intrinsic cancer, so, I say that early diagnosis is the real treatment of either type of cancer of the larynx. The earlier the diagnosis and treatment, the better chance the patient has for life.

DR. J. F. HYNES (Wilmington): I enjoyed Dr. Houser's paper very much and I was particularly interested in his plea for early diagnosis. I see six or eight or sometimes ten cases of cancerous larynx over a year, and some are quite advanced. I am thinking of the extrinsic cancer; those are the ones most frequently referred to me. The patient gives a history of chronic sore throat, enlargement, and sometimes nodes. Many of those patients have never had even a meager examination of the larynx until a week or two before being referred for palliative x-ray therapy, and I am afraid I have seen one or two patients who have been under treatment with a nose and throat man for a time, without recognition of the disease. Adequate examination of such patients—I am sure it is easy enough, with a little practice, to use a mirror, is of the utmost importance.

I might mention here that it is possible to make an examination of the larynx without the usual tools; by dropping the patient's head over the table and using a head light, you can look down some people's throats, without special instruments. Internal biopsy goes without question. Sometimes those patients have been treated for syphilis before it is recognized they had also a cancer. The incidence of laryngeal cancer, I suspect, may be increased inluetics.

Finally, and I don't mean to take issue with

Dr. Houser in his wide experience, but there are cases of intrinsic cancer that have been treated by x-ray with excellent results, usually on the basis of the physical condition. I have in mind an old lady treated by x-ray at 75 and who died at the ripe old age of 85 without a recurrence. Another, an old man, with bronchiatic cancer, was successfully treated. Such cases, where surgery is rather too risky, have done very well, and I am inclined to think the intrinsic cancer picked up early enough gets along pretty well if treated in the proper fashion. Of course, there is too much evidence on the side of the value of surgery, but I do know some are cured with x-ray treatment.

DR. A. J. STRIKOL (Wilmington): I think the last speaker is all wrong when it comes to diagnosing or examining the larynx by having the head in a certain position. Even under the most favorable conditions it is difficult sometimes to see all of it. I do not think anybody ought to rely on such methods. In fact I do not rely on the biopsy and directoscope entirely. We sometimes have to think of three or four things. But I feel the way this other gentleman who spoke feels, if I have suspicion of the lesions, I would rather send the patient to a laryngologist who is doing a lot of that kind of work, who can handle the case much better, and with better results. The intrinsic cases, diagnosed early and operated upon early, show about 80% cures.

We do not know why it occurs primarily in men, one to eight or one to nine. In my practice I have had 30 or 40 cases of malignancy of the larynx in men, and only one female.

I again want to say I enjoyed the talk, and again I want to warn that Dr. Hynes was a little misleading when he said he can see and diagnose by having the patient in a certain position, when the best of examinations sometimes fail.

DR. LEMUEL C. MCGEE (Wilmington): Physicians when discussing early diagnosis are characterized by proneness to stimulate one another to early diagnosis, and point out or indicate their consequent errors in a busy practice. I want to mention an example on the encouraging side, for me: Last year, in industrial examinations, I found three instances of early carcinoma on the larynx,

which was detected by examining physicians on the basis of the employees referring to the fact that they had been hoarse for a variable period of time. There were no other symptoms and the examining physician in each instance, in spite of his other duties, was cagey enough to grab a laryngeal mirror, take a look, and found enough to follow through in each instance. The carcinomas have been removed. So, as far as I am concerned, there is an encouraging side: that progress has been made in doing just the thing you would like to see done.

DR. HOUSER: There are just a few things I would like to mention briefly. One, the question of biopsy. In the earlier years there was some fear that biopsy might stir up a lesion of this sort and cause it to run wild, so that before you could do something about it, it would result in such a growth that conditions would be out of hand. I think that this fear is unfounded. One can do a biopsy and have an examination made with plenty of time before conditions get worse, to go ahead with the proper procedure.

I agree with you doctor, about the improvement in the diagnosis and the examining of laryngeal patients, especially by the younger physician. For the last, certainly 15 or 20 years this condition has been drummed into the medical student, and it has been impressed on his mind, that he should investigate cases of laryngeal disfunction. In addition to that I think most medical students are today trained in their out-patient department work to know how to use the laryngeal mirror, which is certainly not true of, I would say the older generation of medical men. Most of these cases that have not been studied by mirror examination will come from the doctor who is not familiar with the use of the laryngeal mirror. As someone has said, the technique of mastering the laryngeal mirror is relatively simple.

Now with regard to the elective treatment of whether you use radium or surgery; there is no question about it that cures of these laryngeal lesions have resulted from radium alone; and where there are other extenuating circumstances that prevent surgery that, then, is the thing to do. But I advise anyone of you who develop a lesion, if you can have

surgery performed, your chances of permanent improvement are decidedly better than where radium alone is used. Thank you, very much.

METHODS OF TREATMENT AND TRANSPORTATION OF COMPOUND FRACTURES OF THE LONG BONES

LT. COL. GEORGE O. EATON, M. C., A. U. S.
Camp Pickett, Va.

Transportation of the recently wounded is more commonly referred to as evacuation since its direction is toward the rear. Treatment and evacuation are intimately related to each other since the amount of treatment at any one medical unit will be influenced by the availability of transportation and the type and duration of travel. The condition and prognosis of the patient is seldom improved by travel in the theatre of operations. Travel is often arduous as well as hazardous and subject to unavoidable delays en route. Evacuation of casualties is one of the chief responsibilities of the medical corps. It is a standing order that the patient will not be evacuated until, from a clinical stand point, it is safe to move him. Evacuation must be prompt in order to allow combat units to preserve their mobility and in order to promote morale in the remaining effective troops.

We speak of echelons of medical treatment and echelons of evacuation. The first echelon of treatment is the company aid man who accompanies troops into battle and who renders skilled first aid to the injured on the field of battle. The first echelon of evacuation is the litter carrier from the battle field to the battalion aid station which is usually situated two to three hundred yards behind the front. The lightly wounded or walking wounded may make their way unaided. Normally, ambulances are substituted for hand-carried litters at the forward limit of traffic and hospital trains for ambulances at the forward limit of rail traffic. Since so much of the Pacific campaign was fought in uncivilized and undeveloped country, long hand carries, often under cover of darkness, were common. Many a Yank and Aussie can thank the loyal and sturdy fuzzy-wuzzy of New Guinea for his successful evacuation to the rear. Any vehicle

which rolls, floats or flies was utilized as the circumstances dictated.

The sorting of casualties occurs at every medical installation in the chain of evacuation and hospitalization. Those physically fit are returned to duty. No patient is sent farther to the rear than his physical condition requires or the demands of the military situation permit. Statistics show that 68% of all battle wounds are wounds of the extremities and that 50% of this group are compound fractures. Because of the long duration of treatment and convalescence, these patients are evacuated to general hospitals in the rear areas. Such cases normally pass through, and are treated by, four echelons in the overseas theatre, the battalion aid station, the clearing company, the field or evacuation hospital, and the general hospital.

Wound management has been classified by Col. E. D. Churchill into three phases: initial, reparative, and reconstructive. The first two concern the overseas theatre, the last is the mission of the hospitals in the United States, which is referred to as the zone of the interior.

The initial treatment consists of first aid and shock therapy which is done on the battle field and at the battalion aid station, and then definitive surgery which is done at the clearing company. These efforts are directed toward the preservation of life and limb. On the battle field, morphine sulfate, sterile dressings, tourniquets and splints are applied; plasma being available for use as indicated. At the battalion aid station, the medical officer inspects the wounds, adjusts the splint, and supervises shock therapy. One of the greatest medical advances of this war was the recognition of the superiority of whole blood over plasma for the treatment of shock. Except in the case of burns, transfusions of whole blood were substituted for plasma more and more as our experience increased. It became common to use four to six litres in a single case. The bank blood flown from the U. S. was packaged so that it could be administered just as simply as plasma. Serious transfusion reactions were very infrequent and the effectiveness of blood in combatting shock was found to be far superior to plasma.

The clearing company is the most forward medical unit equipped for operative surgery.

Working in conjunction with these units are the portable surgical hospitals and the surgical teams. Here, the soldier has his first opportunity for operative surgery, namely the all-important debridement. Upon arrival, re-evaluation of the patient as to the presence of shock is accomplished, and if present, must be given precedence over operative surgery. In compound fractures, definitive surgery consists of adequate debridement, approximate reduction, and immobilization of the extremity.

Two misconceptions existed during the early stages of the war pertaining to the subject of debridement. One was that debridement of a wound became an obsolete procedure with the advent of the sulfanamides. The availability of sulfanamides and penicillin, useful chemo therapeutic agents as they are, has not lessened the importance and need for adequate debridement. The second misconception was that debridement consisted only of the excision of damaged skin and the extraction of the missile from the depths of the wound. Debridement of a wound of the extremity is adequate only when all tissues traversed by the missile have been explored, all devitalized tissue excised, and the operative wound left wide open. Bleeding points are ligated but not even partial closure of the wound is indicated or justified. During a visit to a portable surgical hospital in the course of my duties as orthopedic consultant, I observed a surgeon closing an extensive wound of the upper arm. He had adequately debrided the wound and the tissues were laid open from the shoulder to the elbow. I found him suturing the skin in the upper and lower portions of the wound because he apparently was a little awe stricken at the size of the wound when he completed the debridement. He was easily persuaded to remove the sutures and leave the wound entirely open. Anyone who has tried to culture anaerobic organisms in the laboratory knows how poorly these organisms tolerate air. The debridement is aimed at prevention of infection particularly anaerobic infection. One seldom saw gas gangrene except in wounds involving large muscle masses and in which the wound had been allowed to seal over the tract caused by the missile. Debridement involves excision, decompression, and aeration of the

wound. The term reparative surgery is applied to the secondary closure of these debrided wounds and is accomplished four to twelve days after debridement. Secondary closure is successful in a high percentage of cases if the wound has been properly debrided and appears clean on removal of the original dressing. It is my conviction that reparative surgery shortens the healing time, markedly reduces the amount of scar tissue, and that it represents an important advance in war surgery.

At the conclusion of the operation of debridement the fracture is approximately reduced. I use the word approximately advisedly. The fracture is usually markedly comminuted. During debridement only completely detached fragments of bone are removed. Because of the extensive damage to bone and soft tissue the tendency to shortening and over riding is minimal. The aim of reduction is restoration of normal length and alignment rather than anatomical reduction of displacement. Internal fixation is justified only if persistent displacement of a fragment jeopardizes the function of a major nerve or vessel.

No satisfactory substitute for the plaster cast for the immobilization of fractures has been developed. Evacuation of compound fractures of long bones in the various types of traction splints such as the Thomas splint, the Tobruk splint, the hanging cast, resulted in complications due to excessive mobility of the fragments, interference with circulation, aggravation of infection, and shock. As a result of such experience, all compound fractures after debridement were evacuated in padded plaster casts which immobilized at least one joint above and below the fracture. On arrival at the general hospital in the overseas theatre, plaster casts were bivalved, wounds inspected and, in the case of femurs, balanced traction substituted for plaster cast immobilization. The time lapse between injury and arrival at the general hospital varied from an average of twenty-one days in the early days of the New Guinea campaign to one to three days during the latter part of the Luzon campaign. This time lapse brought to light a principle not previously emphasized, and that is, a simple fracture of the shaft of the femur will develop shortening and over-riding if traction

is not maintained from the time of injury; in contradistinction, a compound, comminuted fracture of the femur shows much less tendency to displace in plaster and requires less traction to restore and maintain full length.

Distraction of fragments, next to local circulatory damage, appeared to be the leading cause of delayed and non-union. Skeletal traction with Kirschner wire was the standard method of treatment and the early commencement of massage, baking, quadriceps exercises and active motion of the knee and ankle joints was instituted. The fractures of the other major long bones were usually treated by immobilization in padded plaster casts until union was clinically firm. The use of windows in casts for purpose of frequent dressing and examination of the wounds was considered ill-advised. Our criteria for a healthy wound was normal temperature, a lack of pain, and normal circulation in the toes or fingers, even though it was draining under the cast. Offensive odor alone was not sufficient indication for a change of cast.

Osteomyelitis was a common complication of a compound fracture incurred in battle; sepsis however, was very uncommon. The absence of sepsis is a tribute to the nutrition and general physical condition of the soldier, to the value of adequate debridement, and to the value of penicillin which was routinely employed in all compound fractures.

We saw many cases of tetanus amongst the wounded Filipino civilians; we saw none amongst our immunized American soldiers. We saw many cases of gas gangrene amongst the Filipino civilians who lacked medical treatment until our forces were established in their community; we saw none amongst our soldiers if they were adequately debrided.

The reconstructive phase of the treatment of compound fractures is concerned with gaining the maximum function of the limb in which there has been a permanent loss of bone or soft tissue. It involves various types of skin grafting, bone grafting, nerve suture or transplant, arthrodesing operations and tendon transplants. This is too large a subject to discuss in this paper.

To summarize the lessons we have learned and the advances in war surgery which have occurred as a result of our experiences in this

war as pertains to the treatment and transportation of compound fractures of long bones—First: Whole blood is far superior to plasma in the treatment of shock except when due to burns. Secondly: Penicillin when given in sufficiently large quantities is a valuable adjunct to surgery but does not minimize the necessity for adequate debridement. Thirdly: Debridement to be adequate must include the excision of all devitalized tissue and the decompression and aeration of the entire tract caused by the missile. Lastly: For transportation of a major fracture, there is no substitute for a padded plaster cast which immobilizes at least the joint above and the joint below the fracture.

DISCUSSION

Dr. W. Edwin Bird: (Wilmington) I might ask this question. Dr. Eaton says sometimes as little as five pounds of traction produces an over-pull. Do you have any practical rule that we could apply to civilian life? There was an old rule—I don't know who invented it—that a pound per year up to 20 was about right. I have used it as a rough guide and have added some to it or taken some off. Is there any practical rule we can use in civilian life?

Dr. Eaton: In civilian life the fractures are usually simple and is seldom severely comminuted as with gun and shell fractures. Our usual fracture was where the bone was transformed into an average of six to ten or twelve fragments. The difference between the compound gun shot or shell fragment fracture with destruction of the soft tissue and multiple comminution of the bone was the reason that so much less traction was needed to maintain the full length. In the simple fracture of the femur actually we had more trouble than with a compound fracture because of the fact it would take a variable period of time, say, an average of two weeks to get that femur back to a general hospital and in that time there was displacement or shortening and so on, to the point where about thirty per cent would have to be reduced because traction would not effect a realignment of fragment. The compound, multiple comminuted fractures did not displace in plaster on their way, and if they were a little short in the plaster, they were easily pulled out to full length.

For your simple fracture I think twenty pounds skeletal traction, until you prove by portable x-ray that you have overpulled it, is the ideal weight for the average adult. If you get it late, if you have over-riding, I would not hesitate to put 30 to 35 lbs. on it and incline the bed so as to counter balance, until it could be pulled out. If you have to treat a shaft of the femur without benefit of x-ray you have quite a clinical problem on your hands, estimating whether you have too much or too little pull. In a simple fracture you are apt to make the mistake of not putting on enough, and in a compound fracture, if badly comminuted, you might be apt to err on the side of putting on too much traction.

THE FUNCTION OF THE IMMUNIZATION CLINIC IN THE GENERAL HOSPITAL

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In the past, general immunization procedures were reserved for or practiced only on those going to duty in the contagious disease hospital. Usually all the nurses and personnel were immunized against diphtheria, scarlet fever, smallpox, and typhoid fever. In Wilmington all the student nurses affiliate with the Doris Memorial Unit of the Wilmington General Hospital, and before being accepted they must have negative reactions to Schick and Dick tests. This practice has eliminated cases of diphtheria and scarlet fever among the nurses. A survey made among the Wilmington hospitals in 1935-1939¹ showed that fifteen nurses had contracted scarlet fever and five had contracted diphtheria while on duty in the contagious unit. Immunizations were not done systematically prior to 1939. Since 1939 we have immunized for scarlet fever all of the student and graduate nurses and a large proportion of the hospital attendants who came in contact with children at the Wilmington General and Delaware Hospitals.

In spite of the fact that immunization against scarlet fever has been practiced for many years in contagious disease hospitals and many institutions with a marked reduction in

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the number of contact infections, one still hears of much opposition from physicians who are afraid of reactions and who doubt the effectiveness of the procedure. We have inoculated a great number of small children over two years of age without any uncomfortable reactions and thus far without any of them developing scarlet fever subsequently. We have also noted a marked reduction in the number of those becoming ill with the formerly prevalent streptococcal throat.

The method of immunization is described in detail in many publications^{1,2,3,4,5}. The intradermal method is the one of choice, using 0.2 cc. of each of the five doses intradermally on the outer aspect of the arm, reserving the anterior aspect of the forearm for the Dick tests. The outer arm is used because of the possibility of immunizing the skin of the forearm with the injection so that when we repeat the Dick test it might be negative due to local skin immunity and not because of the general immunity of the individual. In children it has been our custom to use 0.2 cc. of the first four doses with very satisfactory results. The Dick test is always repeated two weeks after the fifth injection, and if found positive, the last dose is repeated. It will be found that over 95% of those injected will be negative. Our experience is limited to the use of the scarlet fever toxin.

The problem of preventing tuberculosis and contagious diseases in the general hospital and avoiding contacts and cross infections from patients who are admitted through error is one of importance. Admission of such patients into the general hospital without isolation facilities is not very frequent, but it does occur, usually during epidemics. This acts as a source of infection to the nurses as well as to other patients, especially in the pediatric wards. Such an exposure means that all contacts must be tested, and if positive, given passive immunization followed by active immunization. This must be done not only on the hospital personnel but on the exposed patients as well. All personnel concerned with the handling of a patient, especially the nurse and the doctor, should bear in mind that the chief mode of transmission of infectious disease is by direct or indirect contact; therefore hands must be kept clean and away from the

face and mouth. As Dr. Hoyne² points out, every hospital should be required to have a small isolation unit where student nurses and other hospital personnel can be taught the principles of medical asepsis, diagnosis and treatment in the care of the common contagious diseases. With widespread teaching in testing and immunization there is no question that such diseases as diphtheria, scarlet fever, pertussis, tetanus, the typhoid-paratyphoid group and smallpox can be easily minimized.

The field of preventable diseases has developed so much in the past few years that the average physician has not been able to keep up with all the preparations and procedures. The recent war has emphasized conclusively that active immunization, systematically applied, will prevent many diseases. It has also been shown by many workers that the prevention of many of the childhood diseases is now possible and safe by the use of refined products and improved methods.

The types of preparations have also increased in number. Table I shows the number of products which are in current use in the immunization field.

TABLE I
Immunization and Testing Products in Common Use

1. Diphtheria toxoid, alum precipitated—for children.
2. Fluid toxoid for adults (over 12 years of age).
3. Diphtheria antitoxin.
4. Diphtheria and tetanus toxoid.
5. Diphtheria, tetanus and pertussis toxoid.
6. Scarlet fever toxin for Dick test.
7. Scarlet fever toxin (Tannic acid precipitated) for immunization.
8. Scarlet fever streptococcus toxin for immunization.
9. Scarlet fever Schultz-Charlton test.
10. Scarlet fever antitoxin.
11. Pertussis intradermal skin test for susceptibility.
12. Pertussis vaccine.
13. Pertussis toxoid—alum precipitated.
14. Tetanus toxoid.
15. Tetanus antitoxin.
16. Gas gangrene antitoxin.
17. Typhoid and paratyphoid fever vaccine.
18. Smallpox vaccine.

19. Measles—Immune globulin.
20. Influenza Virus Vaccine, Type A and B.
21. Rocky Mountain Spotted Fever Vaccine.
22. Brucellosis test—intradermal, brucellergin and serum.
23. Staphylococci toxoid.
24. Rabies vaccine.
25. Tuberculin test—Mantoux.
26. Typhus vaccine.
27. Cholera vaccine.
28. Any other test, vaccine or serum can be obtained and administered upon request, such as Antimeningococci antitoxin, Influenza A Serum, Tick fever, etc.

The dosage and technique of administration of each product depends entirely on the strength of the reaction likely to be elicited and on the age of the individual. A highly susceptible person is immunized with reduced dosage and with caution in order to avoid serum sickness or protein shock as much as possible. The interpretation of the test is important before immunization is undertaken. Tests should be done under aseptic precautions and the material injected intradermally, producing a visible wheal in order to produce the proper reaction. Before any injection is given, the patient must be tested for susceptibility—this is more important when horse serums are injected. Table II points out a few of the precautions which are always kept in mind.

TABLE II**Precautions Before Injection of Serum**

1. Always test skin for any serum reaction by intradermal test; 0.1 cc. or diluted 1:10.
2. Conjunctival test: One drop of serum in eye. If positive: redness, blood vessels prominent, eyelids swollen. May relieve conjunctivitis by dropping epinephrin in eye.
3. Tourniquet when possible.
4. Have epinephrine ready in syringe.
5. Warn patient about serum reaction 7-10 days later.
6. Have patient wait 15 minutes to observe reaction.

It is generally agreed that passive immunity by means of the antitoxins, rabbit sera, or human convalescent sera are safe and effective when used under the proper precautions

as outlined in Table II above, and when administered early in the disease.

Table III lists diseases which are preventable by active or passive immunization or by both methods.

TABLE III
Preventable Diseases

- I. ACTIVE IMMUNIZATION
 - A. EXOTOXIC DISEASES
 1. Diphtheria
 2. Scarlet fever
 3. Tetanus
 - B. ENDOTOXIC
 1. Whooping cough (Pertussis)
 2. Typhoid
 3. Paratyphoid A & B
 4. Cholera
 5. Plague
 6. Staphylococci infections
 - C. VIRAL AND RICKETTSIAL
 1. Smallpox (Variola)
 2. Typhus
 3. Rabies
 4. Yellow fever
 5. Rocky Mountain spotted fever
 6. Equine encephalomyelitis
 7. Influenza A & B
- II. PASSIVE OR BORROWED IMMUNITY
 1. Diphtheria
 2. Scarlet fever
 3. Tetanus
 4. Pertussis
 5. Measles (Rubeola)
 6. Chickenpox (Varicella)
 7. Mumps (Epidemic parotitis)
 8. Meningitis (Meningococci)
 9. Rocky Mountain spotted fever
 10. German Measles (Rubella)
 11. Influenza A Rabbit Serum
 12. Gas Gangrene antitoxin

Through the cooperation of the Wilmington City Board of Health an immunization clinic was planned for each of the four city hospitals, the hospital to operate the clinic on the same basis as any other clinic with the Health Department supplying the immunization material. At the present time such a clinic has been established in the Wilmington General and the St. Francis Hospitals. One has also been started in the Delaware Hospital, but for the time being the immuniza-

tion procedures are limited to the hospital personnel.

The function of the immunization clinic is outlined in Table IV.

TABLE IV

Function of the Immunization Clinic Will Be to Test, Interpret and Immunize the Following:

1. All hospital personnel.
2. Hospital patients upon request.
3. Indigent patients referred by their physicians.
4. Indigent cases referred by any welfare agencies
5. Private cases referred by their family physician.
6. Physicians will be encouraged to acquaint themselves with the immunization procedures so that they can immunize their own patients in their offices.
7. All patients should be sent to the clinic by appointment with the clinic nurse.

The program as outlined at present for the immunization of the hospital personnel is shown in Table V.

TABLE V

Immunization Program for the Hospital Personnel

- I. Persons to be tested and immunized if positive:
 1. Student nurses
 2. Graduate nurses on staff who have not been previously tested.
 3. Lay personnel who come in contact with the following:
 1. Diet kitchen
 2. Junior Board Soda Shop
 3. Nurseries
 4. Maternity
 5. Children's floor—ward or private rooms
 4. All hospital residents.
- II. Required preadmission immunization for student nurses:
 1. Smallpox—a scar must be present from the successful vaccination of not older than six months. Signed statement from physician.
- III. Tests to be done on admission:
 1. Dick
 2. Schick
 3. Schick control

4. Tuberculin—two strengths—Mantoux.

IV. Immunization to be carried out on those positive:

1. Scarlet fever—intradermal method.
2. Diphtheria—fluid toxoid. For children and adults.
3. Typhoid Paratyphoid—three injections at weekly intervals— $\frac{1}{2}$; 1; and 1 cc. of the triple typhoid hypodermically; or 0.1; 0.15; and 0.2 intradermally.
4. Smallpox—if no recent (within 3-5 years) scar is present.
5. Those positive to the tuberculin tests should have chest x-ray. If negative, retest every six months, and x-ray if positive. Retest earlier if individual loses weight or has any attacks of "appendicitis" or any severe upper respiratory infection.

V. Throat cultures for Lansfield Group Group A Hemolytic Streptococci:

1. Culture throats of all individuals working in or entering the nursery or maternity department. If positive to hemolytic streptococci or diphtheria bacilli, treat until negative. Such individuals may work in any other department except nursery, children's wards or diet kitchen.
2. Individuals with colds or diarrhea should not be allowed in nursery, maternity, children's wards, or diet kitchen.
3. Culture suspicious throats and nostrils of sick individuals.

VI. Wearing of masks:

1. Masks should be worn by all individuals in nursery.

VII. Aseptic technique similar to that used in the "Cradle" at Evanston, Illinois, should be considered for use in the nursery and premature room.

VIII. All immunization material to be kept in the refrigerator and Smallpox vaccine in the Ice compartment. All records kept in clinic. Testing and immunization to be done by appointment

on specified day. Syringes, needles, sterile material are already on hand. Procedures followed in past years to be adhered to.

- IX. Other diseases to be considered for immunization at the clinic when opened, or may be used on any house or dispensary patient upon request.

It is hoped that with time and experience valuable information will be obtained in the practical application of active preventive medicine and that hospital cross-infections and such epidemics as influenza, impetigo, and diarrhea of the newborn may be avoided.

SUMMARY

A program is outlined for the practical operation of an immunization clinic in a general hospital.

The types and purposes of the preventive procedures are noted briefly.

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SURGERY OF THE STOMACH

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In 1945 the author¹ presented in *THE JOURNAL* a report on the successful removal of the entire stomach for cancer, and also presented personal experiences with sub-total resections of the stomach, removing four-fifth of the stomach for duodenal or stomach ulcers. It was stated at that time that the mortality in radical operations for cancer of the stomach will be high, owing to the fact that many patients are advanced in years, with other associated serious diseases, and that they seek surgical aid late, when the disease has advanced for a long period of time, and that since there is no other possible form of treatment the acceptance of desperate risks is entirely justifiable.

It is a different problem when we consider the question of sub-total gastrectomy for duodenal or stomach ulcers. Here the justification for unusual risks does not exist, and one cannot justifiably continue to perform these operations if the mortality remains high. It is because of a low mortality rate and gratify-

ing results the author has continued to perform gastrectomies on a now rather large series of cases.

Peptic ulcer has now been recognized as a rather common cause of indigestion. Some authorities² claim that about 1 in 10 of the adult population at some time suffers from a duodenal ulcer. All ulcer patients should be given a trial under strict medical management. Indications for surgical management are: ulcers which are intractable to medical therapy; those in which repeated gross hemorrhages have occurred; those which have perforated; pyloric obstruction which does not respond to medical management; and stomach ulcers in which the question of malignancy can not be definitely ruled out.

The ideal operation for peptic ulcer is sub-total gastrectomy. The more conservative procedures such as gastroenterostomy, or various forms of pyloroplasty serve a very limited role in the surgery of peptic ulcer.

We have experienced little or no difficulty with the usual uncomplicated ulcer operation. However, in those cases in which complications, particularly to adjacent viscera, are found, then the operation of sub-total gastrectomy becomes one in which good surgical judgment and technical skill are of utmost importance if one expects a low mortality rate. Recently the author performed two sub-total gastrectomies in which complications of a severe magnitude were found.

Case 1

T. B., Case 2155, male, age 45, referred by Dr. H. T. McGuire on October 9, 1946. His chief complaints were severe abdominal pain and persistent vomiting for past 3 days. His symptoms began 7 years ago when he noted epigastric distress and occasional nausea. Three months prior to admission he was very sick for about 6 days, with vomiting and pain. The diagnosis at that time was posterior perforation of a duodenal ulcer. The patient refused operation at that time. However, on October 9, 1946 preparation for surgery was started. There is no operation with which we have had experience in which cooperation between the surgeon and internist in the preparation of the patient and in the management of the active stage of the ulcer before coming to surgery is more necessary than this one.

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The preparation of this patient for surgery was excellent.

Studies revealed 4,900,000 red cells; leukocytes, 15,400; hemoglob in 87%. Urine showed a trace of albumin. Blood sugar, 90 mg. 100cc. Blood urea nitrogen 15mg./100cc. Serum protein 6.8%. X-ray taken in August showed a large ulcer present in the duodenum. The pre-operative preparation consisted of daily lavages, blood and plasma transfusions, parenteral protein (amigen), vitamin, glucose and saline infusions.

Operation, October 15, 1946. The abdomen was opened through a high right rectus incision. Exploration showed that a fistula existed between gall bladder and duodenum; also that the ulcer had perforated into the pancreas. The gall bladder was separated from the duodenum. Since it was in all other respects normal it was sutured and left in situ. A good deal of difficulty was experienced separating necrotic duodenum from pancreas. The pancreas, which was the seat of a chronic abscess, showed pancreatic juice oozing from the duct. This was closed by fine chromic sutures. The pancreatic defect was closed over leaving no raw surfaces. The duodenum was closed very close to the entrance of the common bile duct. The stomach was then resected, a little more than 4/5 of the entire stomach being removed. The Hofmeister procedure was then used bringing jejunum to the cut surface of the stomach for anastomosis. After four days the temperature, pulse and respirations were normal and continued normal until discharged, 14 days after operation. Fluids, protein, salt and vitamins were supplied by intravenous administration for four days, when feedings by mouth were begun.

Pathologic Examination: Dr. Douglas M. Gay. Gross: "Large portion of stomach, measuring 29.5cm along the greater curvature. The pylorus is included. The entire stomach is congested and the mucosa is thick. A small piece of duodenum is included. This is so blood stained that nothing definite can be made out of it.

Microscopic: "The stomach wall is congested and the mucosa is infiltrated with numerous monocytes, lymphocytes and a few poly-

morphonuclear leucocytes. A section of the duodenum includes the edge of a chronic ulcer. The floor of the ulcer is dense scar tissue. On top of this is granulation tissue and necrotic material. There is no evidence of cancer.

"Diagnosis: Chronic gastritis.

Duodenal ulcer."

This was indeed a severe operation. There were no post-operative complications and the patient was discharged and walked out of the hospital on the 14th post-operative day. Follow-up examinations at this time show the patient to be in excellent health.

The second case report deals with a gastric ulcer as found in the older age group where carcinoma may at times be found in the ulcer bed. Surgical removal of the stomach under these conditions should then include a large area of stomach above and below the ulcer and all gland-bearing areas under observation.

CASE 2

J. H., Case No. 2200, age 62, referred by Dr. E. M. Bohan on October 29, 1946. His chief complaints were severe abdominal pain, vomiting and expectoration with some dyspnea. He had complained of epigastric distress and coughing with much expectoration for many years.

Studies revealed 4,200,000 red cells; leukocytes 12,500; hemoglobin 60%. Urine showed a trace of albumin. Blood sugar, 92 mg./100 cc. Blood urea nitrogen, 9 mg./100 cc. The P. S. B. test was normal. Wassermann was negative. Serum protein 6.4%. X-ray examination showed a large ulcer on the lesser curvature of the stomach in its upper third. Electrocardiogram was normal. The patient was having some tarry stools. A diagnosis of bronchial asthma with bronchiectasis was also made. Here again the fine cooperation between the medical staff and the surgical staff was responsible for the proper preparation of the patient for surgery and the perfect post-operative care, especially with reference to lung complications which this patient might develop.

Operation October 29, 1946. Continuous spinal anesthesia as advocated by Lemmon³ was used. The abdomen was opened through a mid-rectus incision. Exploration showed a large ulcer defect in the lesser curvature of

the stomach in its upper third portion. The ulcer margin was firm. A few nodes were palpable in this area. The presence of malignant ulcer was possible. The stomach was therefore removed very high and including the few lymph nodes found. The duodenum was resected and the stump inverted in the usual manner. The stomach was then removed just one inch below the esophagus on the lesser curvature. On the greater curvature about four inches of stomach was left. The Hofmeister procedure was then followed in completing the operation.

The operation was complete in one hour and twenty minutes. Before the operation his pulse was 90; blood pressure 140/70; respirations 22. After the operation his pulse was 92; respirations 24; blood pressure 140/70. His condition was good throughout the operation. Carbon dioxide and oxygen were used during the operation because of the lung pathology present. This was continued for the first post-operative day. On the next day the patient was sitting on the side of the bed. Deep breathing exercises and drug therapy to increase expectoration were used by Dr. Bohan, thus avoiding pulmonary complications. The patient was normal in every respect on the 4th day. His condition is excellent at present, and he will be discharged in a few days.

Pathologic Examination: Dr. Douglas M. Gay. Gross: "Large portion of stomach measuring 29 cm. along the greater curvature. A clear cut ulcer 1 cm. in diameter is present in the mid-portion of the lesser curvature."

Microscopic: "The floor of the ulcer is lined with fibrin and polymorphonuclear leucocytes. Below this there is granulation tissue extending to the serosa. The gastric mucosa is overhanging the ulcer edge as a regenerating fold. There is no evidence of cancer."

"Diagnosis: Ulcer of the Stomach."

CONCLUSIONS

1. A discussion concerning sub-total gastrectomy and the more conservative surgical procedures for peptic ulcers are presented.

2. Cooperation between the medical and surgical staff is important in the surgery of peptic ulcer if one desires a low mortality rate.

3. A duodenal ulcer which had perforated into the pancreas and into the gall bladder is

presented. A successful sub-total gastrectomy was performed, along with repair of the pancreas and the gall bladder.

4. A recent successful sub-total gastrectomy for gastric ulcer which simulated cancer in the old age group is presented.

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2. Christopher, Fredrick: Textbook of Surgery, 3rd Ed., p. 1145 Phila., W. B. Saunders Co., 1943.
3. Lemmon, W. T.: A Method for Continuous Spinal Anesthesia, Ann. Surg. 111: 141, 1940.

SCIENTIFIC EXHIBIT

Centennial Session — American Medical Association

At the Centennial Session of the American Medical Association to be held in Atlantic City, June 9 to 13, 1947, the Scientific Exhibit will include both the history of medicine during the past century and the latest developments of medical science.

Application blanks for space are now available. All applicants must fill out the regular form. Applications close on January 13, 1947, after which time the Committee on Scientific Exhibit will make its decision and notify the applicants.

Application blanks for space should be procured as soon as possible. They are available from The Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago, 10, Illinois.

AMERICAN UROLOGICAL ASSOCIATION

"Urology Award—The American Urological Association offers an annual award 'not to exceed \$500' for an essay (or essays) on the result of some clinical or laboratory research in Urology. Competition shall be limited to urologists who have been in such specific practice for not more than five years and to residents in urology in recognized hospitals.

For full particulars write the Secretary, Dr. Thomas D. Moore, 899 Madison Avenue, Memphis, Tennessee. Essays must be in his hands before May 1, 1947.

The selected essay (or essays) will appear on the program of the forthcoming meeting of the American Urological Association, to be held at the Hotel Statler, Buffalo, New York, June 30-July 3, 1947."

"See Your Doctor"

This is the 199th advertisement in the Parke-Davis series on the importance of prompt and proper medical care.

This timely message in behalf of the medical profession will appear this month, in full color, in LIFE and other leading national magazines read by more than twenty-three million people.

Some things you should know about pneumonia

No. 199 in a series of messages from Parke, Davis & Co. on the importance of prompt and proper medical care.

O if they can clear up pneumonia easily now with the new drugs.

You're probably heard some such remark in recent years. Actually it's only a partial truth. While medicines *do* make wonderful gains in its struggle with pneumonia, the disease can still be critical or even fatal—and you owe it to yourself to have up-to-date information about it.

Kinds of pneumonia

There are a number of different kinds of pneumonia. By laboratory tests, X-rays, or other diagnostic methods, your doctor can tell which kind a patient has. He can then determine which, if any, of the new infection-fighting drugs should be used.

Here are the major kinds of pneumonia:

1. *Pneumococcus pneumoniae*

In most years, the majority of pneumonia cases in the United States are caused by organisms of the pneumococcus family. There are about 40 types of these organisms. Fortunately, the sulfa drugs act against all these 40 types.

2. *Streptococcus pneumoniae*

Organisms of the streptococcus family can also cause pneumonia. Your doctor can fight them, too, with one of the sulfa drugs, penicillin or other antibiotics.

3. *Friedlander's pneumoniae*

This is brought on by an organism known as Friedlander's bacillus. Neither sulfa nor penicillin is effective, but streptomycin—a new drug, not yet generally available—has been successfully used in some cases.

4. *Virus pneumoniae*

Rarely recognized 15 years ago, this has now become a common in the United States. There are an undetermined number of types of virus pneumonia, most of them highly contagious. Virus pneumonia, unfortunately, do not yield to the new infection-

killing drugs, and in these cases prompt diagnosis and careful nursing are especially important.

Preventing pneumonia

In spite of the effectiveness of the new drugs against most kinds of pneumonia, your doctor would rather help you prevent the disease than cure it.

There is no vaccine that has proved satisfactory in immunizing against pneumonia. But there is a great deal you can do to avoid getting it.

Pneumonia often attacks a person who is run-down or over-tired, or who has had grippé, influenza or a severe cold. So if you have a cold with fever or a cough that hangs on, or if you suspect you have grippé or influenza—all year there.

For by hiding you through these less serious ailments, you can enormously reduce your risk of contracting pneumonia.

Medicine's winning fight

Because of the remarkable strides medicine has made in the last twelve years, there's been a spectacular decline in death from pneumonia.

Actually, less than half as many Americans die now from pneumonia as in 1914.

In the old days, the average pneumonia patient ran a high fever until the seventh, eighth or ninth day. Now, however, your doctor may be able to reduce your fever to normal within 24 hours.

In fact, when a person in reasonably good health contracts pneumonia today, the chances are that prompt and proper medical attention will bring him through.

See your doctor! Whenever you or your children have severe colds accompanied by fever, call your physician promptly.



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+ Editorial +

DELAWARE STATE MEDICAL JOURNAL

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MILLIONS WASTED ON COLDS

Outmoded self-treatment methods and commercial advertising are largely responsible for the waste of millions of dollars annually by people with colds, grip and influenza, according to Hobart A. Reimann, M. D., of Philadelphia.

Writing in the November 2 issue of *The Journal of the American Medical Association*, Dr. Reimann, of the Jefferson Medical College and Hospital, refers to many of the preventive and therapeutic measures in common use as "obsolete" and "illogical." He especially condemns the waste of the sulfonamide compounds and such antibiotics as penicillin which are ineffective for these viral infections.

Respiratory diseases are widely prevalent and "account for most of the home visits (32 per cent) and provide the second most common

reason (15 per cent) for office visits to general practitioners," states the author. "The average person is said to suffer from one to four bouts each year, accounting for about 250,000,000 infections annually in the United States. Infections of the respiratory tract cause more loss of time from industry and from schools than all other diseases combined. They are rarely a direct cause of death, but they precede or incite many other serious infections (such as pneumonia or meningitis)."

Except for influenza vaccine there are no specific preventive procedures, and no specific treatment exists for any infection of the group. The most that can be done for the patient is to relieve discomfort, to prevent complications without impeding the natural process of recovery and to minimize the spread of infection to others.

If aching and headache are present they are best controlled by warmth, rest in bed and the use of an analgesic. There is no need to change from the normal diet and fluid intake in the average infection. Rest, as for any other infectious condition, is the best treatment for it serves several purposes: (a) aids recuperation, (b) lessens complications, (c) prevents the spread of the disease to others and (d) keeps the patient from acquiring a more serious infection from contact with "carriers."

Good health alone is no insurance against colds. Dr. Reimann points out that "although excellent physical condition, peace of mind, adequate diet and pleasant weather supposedly furnish resistance, infections of the respiratory tract occur for no obvious reason in otherwise robust persons. However, certain circumstances known by common experience to lead to colds such as exposure to wet and cold, sudden chilling in drafts, volatile irritants, dust, fatigue and other excesses should be guarded against, or neutralized by rest, warmth and comfort. Reasonably comfortable, temperature and humidity of air in rooms is desirable, but no evidence is available as yet of their specific value. Residence in a climate where colds are less frequent is recommended for those who are subject to frequent infections, if economic circumstances permit."

MISCELLANEOUS

STREPTOMYCIN

Definition

Streptomycin is an antibiotic substance produced by certain strains of *Streptomyces griseus* (K) W. H.

Position of Streptomyces in the Vegetable Kingdom

Division—Thallophyta

Sub-division—Fungi

Class—Schizomycetes

Order—Actinomycetales

Genus—Streptomyces

Species—Streptomyces griseus (Krainsky)

Waksman and Henrici

Definition of the Unit

Originally a unit of streptomycin, or an S. unit was defined as that amount of material which, when present in 1 ml. of a nutrient medium, would just inhibit the growth of a given strain of *Escherichia coli*. The new standard is as follows: *One unit of streptomycin is equivalent to one microgram (gamma) of pure streptomycin base.*

Streptomycin is generally standardized against either *Escherichia coli*, *Bacillus subtilis* or a special strain of *Staphylococcus aureus*.

Production

It is produced by the deep submerged-culture type of fermentation, similar to that used in the production of penicillin.

Properties

Streptomycin is a basic compound of low molecular weight. The hydrochloride and sulfate are extremely soluble in water. It is possible to dissolve 1,000,000 micrograms in one cubic centimeter of water. It is insoluble in common organic solvents. It is quite stable both chemically and biologically. Solid preparations have been stored in a refrigerator for periods of greater than six months without any loss of potency and sterile solutions maintain their potency up to three weeks at 37° C. Its antibacterial action is greatest at pH 8-9. Its activity is influenced by the presence of various salts and is markedly reduced by glucose, phosphates, carbon dioxide, cevitamic acid and cysteine. The salts are extremely hygroscopic.

Methods of Administration

A. Parenteral

1. *Intravenous*—Continuous drip is advocated, using a total daily dosage of 1,000,000 to 4,000,000 units. Half of the amount to be given is dissolved in one liter of normal saline solution and given at the rate of 25 drops per minute, a total of two liters being injected in a twenty-four hour period.

2. *Intramuscular*—Varying doses injected. Generally 100,000 or more units every three or four hours. Total daily dosage by this method—1,000,000 to 2,000,000 units.

3. *Subcutaneous* — Injection of 100,000 units per cc. of normal saline at three or four hour intervals. Total daily dosage—1,000,000 to 2,000,000 units.

4. *Intrathecal*—100,000 units in 5 or 10 cc. of normal saline injected directly into the spinal canal. This dose may be repeated at twenty-four or forty-eight hour intervals.

B. *Nebulization* — Up to 500,000 units daily in concentrations of 25,000 or 50,000 units per cc. of normal saline. Administered by means of a glass nebulizer.

C. *Oral*—500,000 to several million units daily in four divided doses. When taken by this method there is little or no absorption from the gastrointestinal tract. It is not destroyed by the acidity of the stomach, however.

Antibiotic Spectrum In Vitro

In vitro results indicate that streptomycin is active against the following organisms:

Gram Negative

Eberthella typhosa

Escherichia coli

Brucella melitensis

Aerobacter aerogenes

Hemophilus influenzae

Hemophilus pertussis

Klebsiella pneumoniae

Pasteurella pestis

Pasteurella tularensis

Proteus vulgaris

Pseudomonas aeruginosa

Salmonella paratyphosa and *Salmonella schotmuelleri*

*Gram Positive**Mycobacterium tuberculosis var. hominis**Bacillus subtilis**Staphylococcus aureus*

Majority gram negative.

Possible Uses

It should be remembered that clinical results do not necessarily parallel *in vitro* success or activity in experimental animals.

It is *possible* that streptomycin will be of value in the following:

1. Combined with Promin in the treatment of tuberculosis.
2. Pre-operative use as an "intestinal cleaner" in place of the sulfa drugs.
3. In some types of colitis.
4. In treating wound conditions or infections due to common gram-negative organisms.
5. In various infections due to *Klebsiella pneumoniae*.
6. In the treatment of *Salmonella* infections.
7. In the treatment of various urinary tract infections due to gram-negative organisms.
8. In the treatment of typhoid fever.
9. In the treatment of tularemia.
10. In the treatment of influenzal meningitis.

Present Status of Supplies

About 30,000 Gms. per month being produced.

37% available to Civilian Production Administration to civilian clinical research under Dr. Chester Keefer of the National Research Council. Remaining 63% is allocated to the Army, Navy, U. S. Public Health Service and Veterans' Administration.

Patchwork, October, 1946.

Allergy

The American Academy of Allergy will hold its annual convention at Hotel Pennsylvania, New York City, November 25-27 inclusive. All physicians interested in allergic problems are cordially invited to attend the sessions as guests of the Academy without payment of registration fee. The program has been arranged to cover a wide variety of

conditions where allergic factors may be important. Papers will be presented dealing with the latest methods of diagnosis and treatment as well as the results of investigation and research. Advance copies of the program may be obtained by writing to the Chairman on Arrangements, Dr. Horace S. Baldwin, 136 East 64th Street, New York City, prior to November 10th.

Penicillin May Cause Nerve Injury

Two Navy doctors suggests that penicillin may cause injury to the nerves running to the surface of the body with resultant loss of sensation and muscular power, according to the October 12 issue of *The Journal of the American Medical Association*.

Comdr. Lawrence C. Kolb, (MC), U.S.N.R., and Lieut. Comdr. Seymour J. Gray, (MC), U.S.N.R., state that they observed this muscular weakness in seven patients treated with penicillin injections into the muscles at the U. S. Naval Hospital, National Naval Medical Center, Bethesda, Md.

The nerve injury observed in all the cases occurred from 10 to 21 days after the initial injection of penicillin. The number of penicillin injections into the muscles given prior to these symptoms varied from 10 to 72.

The authors point out that complete recovery from the neuritis occurred within four months in five of the seven patients.

Delaware Academy of Medicine

Due to the request of several members, the Library of the Delaware Academy of Medicine, will be open on Wednesday evenings, from 7:00 to 9:00 o'clock, beginning as of November 6, for a four month trial period.

The Library as of this date, will be closed on Saturdays.

We hope you will make your visits frequent, on Wednesday evenings.

Sincerely yours,

THE DELAWARE ACADEMY OF MEDICINE, INC.

FRANK HOOPES, Chairman,
Library Committee.

Infection with tuberculosis may be compared to the action of an incendiary bomb. It may come to rest in any isolated area of the body, generally first in the upper respiratory passages, and then may quickly be dispersed to other areas, like the bomb fragments causing incendiary fires.

The germ of tuberculosis may reproduce rapidly and set up secondary zones of inflammation and disease. Treatment is essentially like the suppression of the bomb. Nature assists in the process in trying to wall off the germ and build up a wall around it which isolates from oxygen and other food nutrients brought to it by the blood stream. Putting out the fire of tuberculosis demands early finding of the infection and a mustering of all body forces of resistance to put out the fire in the same manner as the community would deal with an incendiary bomb.—*Health and Safety Medium*, Feb., 1946.

Tuberculosis has become a serious problem to the health authorities in every country where war means greatly lowered living standards, extreme overwork, and a governmentally regulated diet which has not yet proven adequate when rationing becomes severe. In England and Germany, two countries in which tuberculosis authorities were questioned, the war presented the ideal set of conditions optimum for the incubation and transmission of pulmonary tuberculosis. There now appears sufficient evidence to warrant the conclusion that this new type of warfare—namely the bombing of city areas for strategic purposes—compounds the problem of tuberculosis in wartime.—George A. Wulp, M. D. *The Effect of Bombing on Health and Medical Care in Germany*, October, 1945.

To prevent errors in diagnosis, it should be a routine practice not to make a diagnosis of pneumonia, bronchitis, asthma, pleurisy, chest cold, catarrhal fever or grippe without first considering the possibility of tuberculosis. The symptoms and physical findings in these cases may be the same as those encountered in tuberculosis. To determine definitely the presence of tuberculosis an X-ray and spu-

tum examination and occasionally a tuberculin test are requisite for all these patients. This would not be an impractical or uneconomical procedure, for the yield of active cases of tuberculosis would be considerable.—I. D. Bobrowitz, M. D., and Ralph E. Dwork, M. D., *N. E. Jour. Med.*, Jan 11, 1946.

BOOK REVIEWS

Diabetes—A Concise Presentation. By Henry J. John, M. D. Pp. 300, with 73 charts. Cloth. Price, \$3.25. St. Louis: C. V. Mosby Company, 1946.

This is a very good treatise on the subject. The author, through the medium of many individual case discussions, gives a thorough coverage of the subject. The full discussion of the limitations of blood sugars is very enlightening on a subject greatly misunderstood by the vast majority of physicians. The dogmatic manner of presentation stimulates one's interest in the book. Though the reviewer does not agree—as who does on diabetes?—with many of the statements made in the book, he finds that the book covers the subject better than some of the post-graduate courses on diabetes which he had attended. The absence of any reference to a routine urine acetone test in diabetes is the only serious fault found in the book—of course this might be a matter of opinion.

The reviewer specially recommends this book to the physician of the pre-insulin day, especially the PZI days.

A Primer for Diabetic Patients: An Outline of Treatment for Diabetes With Diet, Insulin and Protamine-Zinc Insulin, including Directions and Charts for the Use of Physicians in Planning Diet Prescriptions. By Russell M. Wilder, M. D., Professor and Chief of the Department of Medicine of the Mayo Foundation, University of Minnesota: Senior Consultant in Division of Medicine, Mayo Clinic. Eighth Edition, Reset. Pp. 192, with 8 illustrations. Cloth. Price, \$1.75. Philadelphia: W. B. Saunders Company, 1946.

This is a very well written primer for the diabetic patient. The "Questions" following each chapter draw the patient's attention to the important parts of the preceding chapter. The chapters covering the treatment by insulin, diet, and substitution for foods, not only are of prime importance to a diabetic patient but are also useful to the physician.

